The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Industrial Water

THE purification of industrial water and the availability of water for industry are subjects of the greatest importance. In a country so densely populated as Great Britain there must always be difficulty in dealing with effluent waters, and industry must be prepared to stand the cost of purifying many of the industrial wastes that it produces. Even now there are such anomalies in existence as the right of discharge of fouled water into a stream which is used, lower down, by a works of which the owners must purify other people's effluent before they can use it. It is fortunate that the bacterial action of Nature on the beds of our rivers is sufficient to purify the water from the usual countryside pollution, but when the pollution arises in concentrated form from a works it is then beyond the power of natural agencies to purify it. The work of the Water Pollution Research Board has indicated that the best policy is one of collaboration between the local authority and the works. If the sewage can be regulated in quantity and rendered not unreasonably foul it can be purified along with the town's sewage. The Report of the Board mentions, for example, that at Birmingham the spent gas liquor, which must be very considerable in quantity, is added in regulated amounts to the settled sewage, the proportion being some 0.08 to 0.25 per cent. by volume.

A difficulty that frequently arises with drinking water is the presence of lead. Its action upon the human body appears to be cumulative and as little as 0.5 parts per million is considered dangerous. Country houses, and indeed many local authorities, have this trouble which arises from the fact that an acid water has a slight solvent action on the lead. It was found that the dangerous waters were not only acid but contained very little calcium and magnesium. When allowed to stand in contact with lead, as would happen in lead water pipes, appreciable quantities of the lead were taken up by the water. The solution of the difficulty lies in the filtration of the water through limestone, when the amount of lead taken up was found to decrease from 1 to 0.3 or 0.16 units. This, of course, is not industrial water, but the same principal of alkalinity seems to run through water purification.

It is rather surprising to reflect that water purification is in itself perhaps the biggest single industrial operation in the world. The water descends from the clouds, already contaminated with bacteria and dust. It flows into the rivers and picks up a lot more contamination. In the rivers, unless adequate measures are taken, it may become positively dangerous to human life, but with proper safeguards, such as those which the Water Pollution Board is now trying to ensure everywhere, it can be self-purified in reservoirs and made fit for human consumption. That does not mean, however, that it is then fit for industrial consumption. The paper read before the Chemical Engineering Group of the Society of Chemical Industry by Mr. Hamer reminded us what a vast amount of care must still be taken to purify industrial water from what are in point of fact no more than traces of dissolved solids, and for certain purposes even the dissolved gases must be removed. Having used the water we usually reject it in a highly contaminated condition. The great sewage works of our towns bear eloquent testimony to this. Industrial waste water, however, may be quite different in that it may be free from bacterial infection, but may carry with it substances which will act as a poison to the benevolent bacteria that purify towns' waste water. It thus becomes necessary that any works which may have an effluent of this character to discharge shall take the necessary trouble to purify its effluent so that at least it can be dealt with by the local sewage works. The Water Pollution Board is always ready, and indeed anxious, to assist in such problems. The work of the Board should be assisted by the fact that it is now to have its own establishment at Watford.

Hearing Mr. Hamer's paper reminded us that it is not always only boiler feed water that requires to be carefully purified on a works. There must be many industrial operations for which water having certain defined characteristics is required and it would be of considerable interest if one day someone would write a paper upon these out-of-the-way methods of purification and storage. The difficulty of obtaining pure H_2O is well known to those who have worked on conductivity measurements; having obtained it pure there is an equal difficulty in keeping it pure.

The great subject of water purification is a never-ending source of additions to chemical literature and there seems always to be something fresh to be said either on the water itself or on its effects. Industrial water must be purified to certain fairly rigid standards if its effects are to be controlled; that is a job for the chemist, and often a specialist job at that. Drinking water must bacterially have a similar close limitation but in respect to its chemical composition there may be room for variations according to taste. Who does not remember the occasion when the immortal Sam Weller drank water: "'You disliked the killibeat taste, perhaps?' 'I don't know much about that,' said Sam, 'I thought they'd a wery strong flavour o' warm flat-irons.' 'That *is* the killibeat, Mr. Weller,' observed Mr. John Smauker, contemptuously."

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NOTES AND COMMENTS

Lord Stamp on Spending

LORD STAMP'S address to the annual meeting of the Abbey Road Building Society deserves the widest possible publicity; and it is specially significant that Lord Stamp has chosen his *unofficial* capacity to give us some of those welcome home truths which are so sadly missing from the pronouncements of the Government when it comes to spending and saving. We have sometimes been driven to the conclusion that the Government was determined to shut up all the avenues of private enterprise in the effort of concentrating the work of the nation on the war. We have felt it our duty to utter a mild protest against some of the measures that have been taken, but no protest of ours carries anything like the weight which goes with Lord Stamp's views, although those views were not put into the form of a protest. Lord Stamp was in the difficulty which so many business men experienced—the difficulty of defending the operations of a building society at a time when we are exhorted to refrain from spending. He said that all the money passing through the building societies must indirectly help to release other funds which can find no other outlet than the war effort; a plea applicable to a very large proportion of the internal trade of the country. An examination of our daily expenditure will reveal the fact that four-fifths of it merely transfers money from the pockets of one citizen to the pockets of another. Such expenditure can have no detrimental effect upon the progress of the war.

Trading and Common Sense

STRIPPED of all complications, it is a fact that except for purchases involving the use of imports, there is very little of our trade that need be effected by the war on financial grounds. The volume of such trade must, of course, diminish, as the persons employed in it are required for the Services or for munition work, but until so required, the national interest is best served by their continuing to perform their normal functions, and by other persons continuinug to purchase their products or employ their services. We realise the difficulty of dealing with the actions of 40 million people, and appreciate the blessings of freedom under which each one of us is still at liberty to spend our money as he likes. Those circumstances no doubt mean that great efforts must be made in one direction or another without too much regard for detail. But it does seem as if, in the last six months, the propaganda designed to curtail consumption and liberate effort for war purposes has been just a little too successful. There need be none of the unemployment of which we still hear so much, if things had been allowed to take a rather more natural course. We are grateful that it happens that the Chief Economic Adviser to the Government is still able to take an interest in outside commercial affairs thus to give us an insight into a common-sense mind, which we have no doubt is actively engaged from day to day in impressing the common-sense view in the highest quarters.

French Raw Materials Assured

THE supply of raw materials to the French chemical industry, an extremely important consideration since the outbreak of war, has been facilitated by the new French agreements with Spain and Greece. By the agreement with Spain the pyrites supply of France has been assured; and by her agreement with Greece, France has secured 100,000 tons of sulphur pyrites and 60,000 tons of raw talc. Payment for these deliveries for both Spain and Greece will consist of consignments of finished products of the French chemical and pharmaceutical industries. For the regulation of raw materials coming from abroad, compensation bureaux have been set up. These bureaux, managed by the associations of the chemical industry, have put a tax on national pyrites and talc, the proceeds being granted to importers of foreign raw material.

India's Chemical Imports

ACCORDING to a recently published survey of the import trade of India for the period April 1 to September 30, 1939, total imports from the United Kingdom in the whole of that period declined both in value and percentage. The competitive position was affected by the reduced imports during September from Germany and the United Kingdom, and by the increased imports in the same month from Burma and Japan. Imports of chemicals and chemical preparations, however, increased considerably from Rs. 1,31.6 lakhs to Rs. 1,70.5 lakhs. Imports of bleaching powder increased from 6.16 lakhs in 1938 to Rs. 6.20 lakhs in 1939, but imports from the United Kingdom decreased in quantity from 89,425 cwts. in 1938 to 88,404 in 1939 although the value increased from Rs. 4.18 lakhs to Rs. 4.46 lakhs. Imports of sodium carbonate increased from Rs. 25.14 lakhs in 1938 to Rs. 35.78 lakhs in 1939 and from the United Kingdom from 471,194 cwts., valued at Rs. 21.26 lakhs to 702,243 cwts., valued at Rs. 31.60 lakhs. Caustic soda imports from the United Kingdom also showed an increase from Rs. 17.99 lakhs to Rs. 26.43 lakhs, total imports being valued at Rs. 27.24 lakhs as against Rs. 19.60 lakhs in 1938. Although total imports of sulphur increased from Rs. 8.64 lakhs to Rs. 10.93 lakhs, imports from Italy decreased as did those from Japan. Total imports of calcium carbide increased from Rs. 3.07 lakhs to Rs. 4.45 lakhs.

DE-INKING WASTE PAPER

Flotation Methods for Removal of Printing Ink

COMPLETE de-inking of waste paper is a necessity if the pulp is to be of any value for remanufacture into high-quality white paper. Froth flotation, as practised in the mining field, has attracted considerable attention in recent years for the purpose of effecting complete separation of the carbon ink particles from the defiberised pulp. The essential object is to cause the particles to rise to the surface in the form of a scum which can be easily removed from the aqueous pulp below.

Successful flotation is found to depend largely upon the use of a heavily diluted pulp. Whereas the preliminary disintegration and desizing of the paper may be effected with a pulp of about 4 per cent. consistency, it may be advisable to dilute to as low as 1 per cent. at the flotation stage. In the process of P. R. Hines (E.P. 441,331) shredded newspapers are first pulped by cooking with 4 per cent. caustic soda solution and beating in a paper beater for about 45 minutes at 60° to 70° C. with 25 to 30 lbs. caustic soda and 4 lbs. sodium silicate per ton of paper (dry weight). The consistency is reduced to not much more than 1 per cent. before flotation. A fairly heavy froth is needed to bring the carbon particles to the surface. Alkali-treated newspaper pulp may be deficient in this respect even when the flotation agent (sodium oleate in the proportion of 2 lbs. per ton of dry paper is recommended) is introduced with the cooking liquor. In that case it is advisable to raise the *p*H to 8.5-9 and to use an additional light frothing agent in the shape of pine oil or cresylic acid. The composition, filling materials, and inks used with different papers are so varied that other flotation agents (*e.g.* the xanthates) may be tried and the most suitable one used according to the result of experiments.

According to Hines the separation of ink from heavily sized high-grade papers (magazines and ledgers) is complicated by the formation of soaps during alkali-cooking which interfere with rapid flotation. These soaps can be flocculated with a weak alkali (*e.g.*, calcium oxide, magnesia) if the *p*H is greater than 7, or with an acidic agent (sulphuric acid or an alum) if the *p*H is less than 7. The proportion of flocculating agent will be of the order of 20 lbs. burnt lime or 4-10 lbs. sulphuric acid per ton of dry papers. Magazine paper again differs from newspaper in forming an undesirably voluminous froth during flotation. Froth reduction is conveniently effected in such cases by a small percentage of a higher alcohol such as hexyl alcohol. Potassium ethyl xanthate dissolved in ethyl chlorocarbonate is reported to be a good froth-collector if the paper pulp being floated has a *p*H of less than 7.

Paraffin oil is employed as the separating agent for the ink particles in the process of H. C. Fisher and the Gardner-Richardson Company (U.S. P. 2,112, 562). Theoretically any water-immiscible liquid which is a solvent for newspaper ink and is lighter than water would be suitable. In practice, however, paraffin oil is more convenient than volatile solvents like toluol and xylol. The flotation tank is fitted with a series of baffle plates designed to promote coalescence of the emulsified ink particles and thereby speed up flotation. As in the previously described process the speed of flotation is also increased by heavy dilution of the pulp with water. Injection of steam through jets also serves to reduce the consistency. The preliminary pulping can be effected either in a standard paper mill beater or in a mixer of the Banbury, Werner-Pfleiderer or Watson type.

Flotation treatment may be preceded by a milling process aiming at further weakening of the bond between individual fibres and ink particles. In the process of T. Earle (U.S.P. 2,116,511) the alkali-cooked pulp is further disintegrated in a rod mill type of disintegrator, the rods and interior surfaces of which are covered with rubber. After flotation with an agent of the fatty acid type such as sodium oleate, the scum of ink particles is removed and the washed pulp finally treated with not more than 2 lbs. of hydrochloric acid per ton of pulp.

Chemical Centenaries of 1940

Discoverers of Scandium, Thulium and Holmium

THE year 1840 saw the birth of two discoverers of chemical elements, both of them Swedish: Lars Frederik Nilson (May 27) and Per Theodor Cleve (February 10). Nilson, who was professor of analytical chemistry at Upsala University and at Stockholm Agricultural College, discovered scandium in 1879; he also studied the other rare earths and prepared 95 per cent. pure titanium metal, in association with Otto Pettersson. Cleve, who likewise taught at Upsala, was the discoverer of thulium and holmium, working independently of the French chemists Delafontaine and Soret. As well as being a chemist, he was noted as a geologist, hydrographer, and botanist.

Edmund James Mills, who was appointed in 1875 to the Chair of Technical Chemistry founded in connection with the then Anderson's University, Glasgow, and was one of the founders of the Institute of Chemistry, and of the Physical Society of London, was born on December 8, 1840. As a chemical technologist he published a variety of researches.

Another celebrity born in 1840 (on February 25) was Sir Hiram Stevens Maxim, who, although remembered chiefly for his invention of the gun bearing his name, invented also smokeless powder, an inhaler for bronchitis, and an automatic sprinkler. He was the first to make incandescent lamp carbons by the process of building up, solidifying and standardising the carbons by electrically heating them in an atmosphere of hydrocarbon vapours, and his patents included chemical processes relating to electricity.

On May 11, 1840, died Thomas Cooper, who, whilst in France (during the Revolution) learned the secret of making chlorine from common salt, and set up as a bleacher and calico-printer at Manchester. Later he occupied the chair of chemistry at various colleges in America.

Thomas Richardson, the well-known industrial chemist, began in 1840 to remove the impurities, consisting chiefly of antimony, from "hard" lead and thus converting it into "soft" lead by means of a current of air driven over the molten metal.

1940 is the tercentenary of the birth of John Mayo, a chemist who might be classed with Hooke and Boyle, and his premature death, at the age of 36, retarded the advent of modern chemistry by a century. At Bath, Mayo made a careful chemical study of the waters, and published the results. He studied specially the chemistry of burning, and developed a theory of combustion on the lines followed by Lavoisier in the next century. He recognised that different gases existed and showed that they all followed Boyle's Law.

On December 13, 1640, was born Robert Plot, Professor of Chemistry at Oxford, who contributed various papers to the Royal Society, including "The Formation of Salt and Sand from Brine," and "On the Substance called Black Lead."

THIODIGLYCOL

Its Synthesis from Ethylene Oxide and Hydrogen Sulphide*

THIODIGLYCOL was prepared first by V. Meyer in 1885 by a somewhat expensive method, which has generally been used since in its manufacture as an intermediate in the production of mustard gas (2,2'-dichlorodiethyl sulphide). Cheaper methods of preparation might introduce new and more peaceful uses for this material which contains the potentially important carbon-sulphur-carbon linkage. Chichibabin (F.P. 769,216 of 1934) synthesised thiodiglycol from ethylene oxide and hydrogen sulphide by the sealed-tube method: Nenitzescu and Scarlatescu of Bucarest, in 1935, combined these gases in molecular proportions to form the product continuously in yields of 90 per cent., but under what appear to have been conditions far below the optimum:

$$2\ (CH_2)_2O + H_2S \longrightarrow (HOCH_2{\cdot}CH_2)_2S$$

The reaction is thus a condensation of two cheap and readily available gases; it gives immediately, quantitatively, and irreversibly a pure liquid of high boiling point (168° C. at 14 mm.). Nenitzescu and Scarlatescu assumed that the reaction took place in two steps, that either activated carbon or a previously prepared amount of thiodiglycol was necessary as a catalyst for the reaction, and that the reaction was essentially accomplished in the gas phase. Preliminary work indicated that all these assumptions were wrong; it was found that the reaction in the gas phase was extremely slow, but that after being dissolved in liquid thiodiglycol the gases reacted rapidly.

A practical method of studying the rate of reaction of two gases is the reading of the change of their total pressure in a closed reaction chamber, and accordingly a simple apparatus making possible the study of pressure changes (and hence gas removal) in a closed chamber previously charged with the two gases was assembled.

Experiments were carried out with two basic objects. The first was the determination, under various conditions, of the over-all rate of gas absorption or solution and reaction combined, i.e., the rate of gas removal. From an industrial point of view this is most important; probably in any large-scale production of thiodiglycol it would be most advantageous to run the gases under pressure (or liquefied ethylene oxide) into a reaction chamber and draw the product off at the bottom. The synthesis thus accomplished would be a single-stage operation requiring but a single unit at constant pressure. The second object was the determination of the physico-chemical effects of solution rate and reaction rate independently to gain an insight into the mechanics of the reaction.

Liquid-Phase Synthesis

As a result of the experiments, it was concluded that, contrary to the assumption of Nenitzescu and Scarlatescu, synthesis does not occur primarily in the gas phase, autocatalysed by the product, nor is the function of activated carbon one of catalysis. The small reaction that does occur in the gas phase proceeds hundreds of times more slowly than in the liquid phase. The association may be defined as the homogeneous reaction in thiodiglycol (or other liquid solvent) of solutions of the two gases to form the liquid product; and the formation of the solutions is described by the usual mathematics of absorption involving the differences in the pressures of the gases above the solution, the differences of concentration in solution, the temperatures of solution, and the area over which solution occurs.

The reaction conforms to the third order, the association involving the simultaneous union of two molecules of ethylene oxide and one molecule of hydrogen sulphide. The percentage of the reactants transformed per unit time under given pressure conditions may be calculated from the kinetic equations of the third order, and the variation of the rate of reaction with temperature may be calculated from the Arrhenius equation. The distinct factors of absorption alone (such as surface area, etc.) are not effective upon the rate of reaction.

High-Purity Yield

Through the use of moderate pressures and temperatures involving only simple routine devices, and in a small chamber devoid of moving mechanism, hydrogen sulphide and either gaseous or liquid ethylene oxide (depending upon whether the selected pressure and temperature will liquefy this material) may be continuously run into the chamber and the product continuously drawn off; the product so obtained will represent a yield in excess of 99 per cent. and the product will be over 99 per cent. pure.

Since thiodiglycol possesses both a military and potential synthetic significance, the object of this investigation has been to determine whether a distinct operation exists in this recently discovered reaction whereby thiodiglycol can be synthesised commercially. The Meyer method is prohibitively expensive, particularly in comparison with the method outlined here which operates at a small fraction of the former raw material, process, and equipment costs.

* From a paper presented by D. F. Othmer and D. Q. Kern, of the Polytechnic Inst. of Brooklyn, in the symposium on Unit Processes before the Division of Industrial and Engineering Chemistry at the 98th meeting of the American Chemical Society, Boston, Mass. (Ind. Eng. Chem., *32*, 2, 160-9.)

Sludge Gas as Fuel

Progress in Birmingham

A SCHEME for the utilisation of surplus sludge gas as fuel for locomotives in place of petrol and fuel oil was considered by Birmingham Tame and Rea District Drainage Board at its recent quarterly meeting.

The report of the Works Committee states that the engineer has submitted a report pointing out that as a result of the additional sludge digestion plant now being installed as part of the extension scheme at the Coleshill works there will be more sludge gas generated than is needed for power requirements at those works. He recommended that profitable use could be made of this surplus gas by utilising it as fuel in lieu of petrol and fuel oil on a number of internal combustion engined locomotives operating at the Minworth and Coleshill works. The committee has approved the recommendation and sanctioned the expenditure of £2,600 for the purchase of plant and equipment required for the purpose, and will ask for the Board's confirmation of its action.

CUPRAMMONIUM SOLUTIONS

An investigation of the nature of cuprammonium solutions in their relation to the dissolution of cellulose is reported by Archipov and Paksver (J. Appl. Chem. U.S.S.R., 1939, *12*, 6, 894-900, French summary 900). It was established that the solubility of different copper salts in ammonia solution is different, and furthermore that the basic copper salt precipitated from the sulphate is non-homogeneous, having present in it compounds varying in composition between $CuSO_4$ and $CuO.H_2O$. The compound with the highest amount of sulphate ion is the first to dissolve in ammonia; the pure hydroxide or oxide hydrate dissolves last, forming $Cu(NH_3)_4.OH$, and it is the concentration of this material that determines the solubility of cellulose in the cuprammonium solution. Its amount can be increased by gradual addition of caustic soda along with the cellulose, and thus the solubility of the latter increased.

Personal Notes

MR. H. BRIDGE has been appointed a director of Thomas de la Rue, Ltd., in succession to the late Major A. Harker, and has taken over the firm's plastic department.

* * * *

PROFESSOR A. V. HILL, Secretary of the Royal Society, standing as Independent Conservative candidate, was successful in the Cambridge University by-election last week. He had a majority of 4,454 over Professor B. A. Ryle (Independent Progressive).

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THE following were appointed at the recent annual general meeting of the British Disinfectant Manufacturers' Association to serve as the officers and executive committee for the ensuing year:—Chairman, MR. H. M. SPACKMAN; vice-chairman, MR. D. S. A. MCDOUGALL; honorary treasurer, Mr. R. A. BLAIR; honorary auditor, MR. R. G. BERCHEM; executive committee, MR. S. BRYAN, MR. A. D. DAYSH, MR. H. W. MACKRILL, MR. A. S. ROXBURGH, MR. S. C. SEAGER, MR. H. A. SMITH; secretary, MR. J. DAVIDSON PRATT.

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DR. HARRY WORK MELVILLE, B.Sc., Ph.D., D.Sc., was appointed to the Chair of Chemistry at Aberdeen University at a meeting of the University Court on February 26. Dr. Melville, who is 31 years of age, has since 1938 been assistant director at the Colloid Science Laboratory, Cambridge. Graduating B.Sc. at Edinburgh in 1930, he took the Ph.D. degree two years later and the D.Sc. degree in 1935. In 1935 he also received the Ph.D. degree at Cambridge University, and was appointed a Fellow of Trinity College, Cambridge. He was elected an associate of the Institute of Chemistry in 1933 and was awarded the Meldola Medal of the Institute in 1936. In 1937 he was appointed a Fellow of the Royal Society of Edinburgh.

OBITUARY

MR. WILLIAM KNIGHT, a director of Messrs. F. E. Rudman & Co., Ltd., chemical manufacturers, Radcliffe, Lancs., died recently, aged 37.

Letters to the Editor

British Chemical Plant Manufacture

SIR,—On p. 113 of your issue of February 24 you have reported that in the discussion of the paper by Foxwell and Reavell I "accused the British chemical manufacturer and chemical plant manufacturer of not really knowing their jobs." I said nothing of the kind. What I did say was that in discussions about supplying complete chemical plants for new processes I always felt that we were in danger of talking too loosely and that there was an elaborate and ridiculous pretence behind such discussions. I stated that this pretence was that the chemical manufacturer, who ought to know his business but did not, asked for a quotation from a chemical plant manufacturer who could not hope to know the business nearly so well as the chemical manufacturer should do; and the latter foolishly assumed that if the chemical plant manufacturer did miraculously know more about the subject he would be prepared to put it on paper free of charge, and submit it as a quotation so that the chemical manufacturer would be able to send round the specifications to the local ironmonger and have the plant built.

You also reported on p. 114 that Dr. Foxwell congratulated me on "debunking" the German chemical plant industry. There is nothing to debunk in the German chemical plant industry. What I desired to bring home to the British chemical plant manufacturer was that the German chemical plant industry did not derive its success from anything more miraculous than hard work added to the opportunities extended by a relatively greater home market. I also pointed out that the German firms were not nearly so enthusiastic about inquiries for complete plants as many people imagined, and that the inquiries sent to Germany for complete plants very frequently met with a cold reception, and rightly so. A big factor in the German success was the understanding among the various firms not to poach on each other's special fields.

I remember at the end of 1914 reading that the British chemical industry had miraculously acquired all the secrets of the German dye industry and that these were being brought over "in a Foreign Office bag." This idea was soon debunked and it was realised that "the secrets of the German chemical industry are all to be found in the text books, but the technique of the application of the principles is a wholly different matter." The British chemical plant manufacturers now have their opportunity, but it is important that they should realise that they will only achieve success by work and enterprise, and that the apples of export trade will not fall into their laps.—Yours faithfully,

London, S.W.1. February 26. HUGH GRIFFITHS.

New Control Orders

Export Licences

THE Board of Trade have made the Export of Goods (Control) Orders No. 5 and No. 6. As a result of the former, a licence will be required for the export of creosote oil to any destination as from March 1. The changes effected by the latter, which comes into force on March 2, include the following: (i) flowmeters *not* containing mercury may be exported to destinations within the British Empire without a licence; (ii) sheep and cattle dips exported to destinations outside the British Empire will require a licence in future only if they contain arsenic compounds; (iii) insecticides, fungicides and weed killers, other than those containing certain specified constituents (e.g., arsenic, cyanides, fluorides, cube, derris, etc.), will no longer require a licence for any destination; (iv) liquid chlorine may be exported to Empire destination without a licence.

Applications for export licences should be made to the Export Licensing Department, Inveresk House, 346 Strand, London, W.C.2.

Import of Felspar and Pyrites

The Board of Trade have issued the Import (Certificates of Origin and Interest) Order, 1939 (Amendment) Order, 1940, dated February 22. As a result of this Amending Order, which came into force on March 1, certificates of origin and interest will no longer be required for felspar, iron pyrites or nickel hydroxide imported into the United Kingdom from any country.

Fertiliser Prices

The Minister of Supply has issued a Direction (No. 3) under the Control of Fertilisers (No. 1) Order, 1939, fixing the maximum prices of certain fertilisers to June next. The price of superphosphate of lime may be advanced by not more than 6s a ton over the February price, and of ground phosphate by 6s. 3d. In the case of compounds, equivalent increases are permitted in the prices of the phosphoric acid content, and an addition of 2s. per ton over the February price is allowed by way of general charges. The other elements in the prices of compounds, that is the charges for potash, sulphate of ammonia and bags, are unaltered.

URBANSKI, MALENDOWICZ AND DYBOWICZ, in a note to the Academy of Sciences, Paris, examine the effect of exposure of nitroglycerine to ultra-violet light. Source of light used was a mercury vapour arc, and the experimenters noticed that the effect of the light seemed to be to decompose the nitroglycerine to some extent. After a sufficient exposure, however, the phenomenon was reversed, and the light served to recompose the explosive. Speed of decomposition depended in large measure on the depth to which the rays penetrated. It was also noticed that nitroglycerine which had been exposed to ultra-violet light exploded more readily on contact with a hot object than unexposed explosive.

A Chemist's Bookshelf

SULPHATED OILS AND ALLIED PRODUCTS, by Donald Burton, M.B.E., D.Sc., F.I.C., and George F. Robertshaw, A.I.C. London: A. Harvey. Pp. 163 and iv. 12s. 6d.

In many branches of industrial chemistry the importance of sulphated oils, or sulphonated oils, as they are often called, is on the increase, especially on account of their uses as wetting and emulsifying agents. The great advantage of the present work, which deals with their chemistry and analysis, is that the authors have succeeded in maintaining a high standard of clarity in dealing with a subject full of opportunities for confusion. The compounds dealt with are notable not only for their own complexity but for the alterations which they may undergo according to the processes of washing or neutralising to which they may be subjected. Professor Hilditch, in a foreword, refers with justice to the service rendered by the volume towards the progress of further research in an important field.

"THE ADVANCEMENT OF SCIENCE" (No. 2, dated January, 1940), being the second quarterly part of the Annual Report of the British Association for 1939-40. London: British Association. Contains pp. 157-372 and Supplement pp. 52-73. 5s.

The present volume contains the full text of Professor E. K. Rideal's presidential address to Section B (Chemistry). Professor Rideal's subject was "Film Reactions as a New Approach to Biology" and his address was the result of an inquiry into the properties of surfaces of separation between bulk phases or of matter in the boundary state, arising out of the observed colloidal properties of living matter due to the fact that an exceptionally large fraction of material and energy is present in films, membrances and the like. A large number of the principal communications to Section B are likewise included in abstract form.

THE ELECTRICAL TRADES DIRECTORY ("The Blue Book"); fifty-eighth edition. London: Benn Brothers. Pp. 1,133. 25s.

Ever since 1883, the year after the first Electric Lighting Act had given Parliamentary recognition to the new social and industrial force of electricity, "The Electrical Trades Directory"—for short "The Blue Book"—has appeared at the beginning of each year. To-day it covers not merely the strictly electrical aspects of manufacture and trade. It contains also general engineering particulars of wide scope and variety. In 1940 electricity, like oil, must serve the citizen at every turn. All phases of engineering are now closely related, and in this war an intense degree of efficiency in innumerable complicated mechanisms is dependent wholly, by land, sea and air, on what a well-organised and progressive electrical industry can produce in its laboratories, drawing offices and workshops. These needs and facts are reflected in "The Blue Book" in some 50,000 entries and headings with many pages of tabulated information—including, incidentally, the temporary addresses of so many firms which moved at the outbreak of war. The editorial arrangement is in four main sections—commercial and technical data, an alphabetical list of firms, persons and societies in the electrical and engineering industries, a geographical section, and a classified section. There are also pages of trade names and telegraphic addresses. Quick reference is provided by tabbed guide cards.

IRON AND STEEL EXPORT LICENCES

It should be noted that as a result of the transfer of the section of the Export Licensing Department dealing with applications for licences in respect of iron and steel from 35 Old Queen Street, London, S.W.1, to Inveresk House, 346 Strand, London, W.C.2, all applications in future relating to these articles should be sent to the latter address.

The Chemist and Electrical Insulation

Trying to Convince Engineers

"THE Chemist and Electrical Insulation" was the subject of a paper read by Mr. L. Massey, M.Sc.Tech. (Metropolitan-Vickers Electrical Co., Ltd.) at a joint meeting of the Manchester and District Section of the Institution of the Rubber Industry with the Society of Chemical Industry and Plastics Group, held at the Constitutional Club, Manchester, last week. Dr. W. J. S. Naunton was in the chair.

In opening his lecture Mr. Massey said that, as a chemist attached to an engineering factory, he spent quite a lot of time in trying to convince engineers that some of their difficulties were due to the operation of simple chemical laws, and not to acts of God, as they were invariably convinced. He had been led to the conclusion that there was a fundamental difference between the processes of thought of the engineer and of the chemist. The engineer thought in terms of mechanical formulæ and observed principles; while the chemist thought in terms of structural formulæ, and the principles which depended on that structure.

As a chemist he believed that his real job started with Dalton's atomic theory and the 92 elements, but at the same time so many of the chemical principles depended, these days, on the structure of the atom that he had to take some account of what the physicist was finding out. Similarly, he was quite convinced that the engineer ought to be able to appreciate some of the ideas of the chemist.

Electrical engineering practice depended on the use of two great classes of materials: the conductors and the non-conductors of electricity. There was a great volume of organised knowledge of the metals from which the conductors were almost exclusively drawn, and design within very close limits was possible. On the other hand insulators were mostly composed of compounds of variable constitution, and data were scarce and contradictory, so that the design of insulators was very often still based on rule-of-thumb methods. Electrical breakdown was nearly always associated with insulation failure, with the result that progress in design which took the form of increased temperature and increased stresses must wait upon the improvement of existing dielectrics, or new dielectrics. That was a matter for the chemist. He must familiarise himself with the nature of the engineers' problems.

The lecturer proceeded to deal with some of the problems still awaiting solution. He said that on changes from a solid to a liquid or liquid to gas there was a decrease in breakdown strength, and in practically all the existing materials decrease in dielectric strength, as the temperature was raised. Quoting any electrical data, one must also quote the conditions under which the test had been made, as they were dependent on conditions of the test such as temperature, the magnitude frequency in time, and the application of the applied E.M.F.

Amongst the problems to be solved was the tendency of what was probably the best material in use, the phenol-formaldehyde synthetic resin, to "track," and the problem might be solved by the combination of phenol-formaldehyde with materials of the non-"tracking" class, which did not possess some of the advantages of phenol-formaldehyde.

After a long and interesting discussion a vote of thanks to the lecturer (afterwards carried unanimously) was proposed by Mr. Martin (chairman of the Manchester Section of the Institute of the Rubber Industry), seconded by Mr. Lowe (chairman of the Plastics Group), while Mr. Cartwright (chairman of the Institute of the Plastics Industry), supported.

DOMINION POTASH, LTD., is now to sell throughout Canada all grades of potash salts produced by the French potash mines, and is now incorporated in Canada, with offices at 1825 Royal Bank Building, 360 St. James Street West, Montreal.

General News——From Week to Week

TOTAL PRODUCTION of British Burmah Petroleum Company, Limited, for January was 54,435 barrels.

BRITAIN TOOK 31.91 per cent. of Rumania's exports of oil during December. This is a 19 per cent. increase over the previous month.

IT WAS STATED at an East Lancashire inquest last week that a malignant growth due to arsenical irritation contracted while working as a labourer at Messrs. Blythe's chemical works, Church, caused the death of William Workman Heaton (46), of Oswaldtwistle.

IT IS ANNOUNCED that the British Association is arranging a conference on science in national and international aspects. The conference, which will be held at Reading on July 24-26, will take the place of the ordinary annual meeting, which would in normal circumstances have been held at Newcastle.

IN THEIR LATEST QUARTERLY BULLETIN, the Council of the British Cast Iron Research Association express their acknowledgments to Messrs. British Acheson Electrodes, Ltd., of Sheffield, for a gift of graphite electrodes for use in the experimental melting shop. Messrs. Adams Hydraulics, Ltd., of York, are nominated as a new ordinary member of the Association, and are represented by Mr. G. Kirk.

A 70,000-GALLON TANK of fermenting molasses gave way at the premises of the Distillers Company, Limited, Hammersmith, last week, and brought down part of the building which housed it, burying five workmen, of whom one was killed. The dead man was John Humphreys, 40, of Protheroe Road, Fulham. Three of the injured men are in Fulham Hospital in a serious condition. They were extricated from the wreckage by firemen, and a roll was called to see if others were missing.

IN A LETTER to the Editor of *Nature* (*145*, 308, February 24, 1940), D. Tabor reports that when using the stick-slip friction apparatus developed by Bowden and Leben, he found that certain lubricants giving smooth sliding on steel at room temperature gave stick-slip motion when heated to moderate temperatures. This effect was reversible with temperature and has been observed with pure fatty acids. It is attributed to a desorption or disorientation of the lubricant film. The work of research was carried out in the laboratories of the Asiatic Petroleum Company.

THE YEAR HAS OPENED very favourably for the china clay industry and the shipments for January were even better than those for the corresponding period in either 1939 or 1938. Notwithstanding the present difficulties of shipping the turnover for January was 65,632 tons compared with 61,147 tons in January, 1939, and 42,742 in January, 1938. Though the Continental markets have been restricted considerably, other foreign markets and the home demand have been fully maintained. A feature of the January figures is the increasing use of the railway; close on 10,000 tons were conveyed by rail.

THE EDITORIAL COLUMNS of last week's issue of *The Dyer* contain interesting comment on the present dyestuffs situation in this country. The position is difficult, though not yet acute, and timely attention is drawn to the fact that many German intermediates and even finished dyes, can be made here, provided the raw materials and plant are available, under the terms of the recent Patents, Designs, Copyright and Trade Marks Act. Plant manufacturers are in many cases unable to deliver plant for new extensions at a normal rate owing to armament requirements, but here is a field undoubtedly worth exploring, with a view to strengthening the domestic position in dyestuffs manufacture after the war.

AT A JOINT MEETING of the Glasgow and Edinburgh Sections of the Society of Chemical Industry, held in the Societies Room of the Royal Technical College, Glasgow, last Friday, March 1, a Jubilee Memorial Lecture entitled "Chemical Aspects of Nutrition as applied to Animals and Human Beings," was delivered by Sir John Boyd Orr, D.S.O., M.D., D.Sc., F.R.S., director of the Rowett Research Institute. The title was chosen before the outbreak of hostilities but the lecturer decided to treat his subject less scientifically than originally intended and placed more emphasis on the economic and political problems of the nation's food supplies at the present time. The lecture proved to be of considerable interest to those not expert in the science of the subject.

Foreign News

HYDROBROMIC ACID, ammonium bromide, potassium bromide and sodium bromide are added to the list of acids and chemicals made in Canada and will be subject to import duty at 20 per cent. instead of at 17½ per cent.

ILMENITE IS OBTAINED as a by-product from cassiterite in Portugal, and official statistics indicate that the total production of ilmenite from this ore amounted to 568 metric tons in 1938, a reduction from 1,151 tons in 1937. Statistics covering exports of ilmenite from Portugal are not available, but it is reported that shipments of the product go chiefly to France and Italy.

PRODUCTION OF BARYTES in Italy by firms controlled by the Societa Commissionaria Baritina of Genoa totalled 41,700 metric tons in 1938. It is estimated that these firms produce more than 90 per cent. of the Italian domestic output of barytes. Based upon this estimate, the total annual output of the product is about 45,000 tons, or 200 metric tons less than the total output for 1937. Official statistics indicate that exports of barytes declined from 65 metric tons in 1937 to 57 in 1938.

MEDICINAL CAFFEINE is being extracted in Georgia (U.S.S.R.) from waste products of the tea industry. It has been established that the tea dust remaining as a waste product during the sorting and drying of tea contains up to 4 per cent. caffeine. Whereas formerly the caffeine was extracted by means of the expensive solvent chloroform, the Soviet Tea Institute has now introduced another organic solvent, dichlorethane, which is both cheaper and more productive.

THE RESULTS OF THE 1939-40 olive season have been, with a few exceptions, very good and total world olive-oil production is much larger than last year and is also larger, though to a lesser extent, than the average. The most important producing countries, which in 1938-39 had obtained very poor crops, this year report extra high yields; such is the case in Spain, Italy, Greece, Portugal and Tunisia, the five countries which between them are responsible for almost the whole of the world olive-oil production.

THE NATIONAL SHORTAGE OF SHELLAC, which comes almost entirely from British India, has forced Germany to resort to the processing of used gramophone records for increasing its shellac supply, according to a report from the U.S. Consulate General at Frankfort-on-Main. Buyers may purchase new records only upon delivery of a corresponding number of old records. The prices paid for old records are 5 pf. for each 25 cm. record, and 8 pf. for each 30 cm. record. It is believed that this measure will result in Germany's securing an annual supply of some 3,000,000 used records.

NOTWITHSTANDING THE ESTABLISHMENT of a few chemical and allied plants in recent years, Peru may still be considered primarily a chemical-consuming market, domestic production being limited primarily to the elaboration of products in general from imported materials, such as pharmaceuticals, biologicals, paints, soap, toilet preparations, and insecticides. The United States and Germany, followed by the United Kingdom, France, Belgium, the Netherlands, Switzerland, Japan, and Italy, are the most important suppliers of chemicals to Peru. In 1938, the latest year for which detailed statistics are available, out of total chemical imports exceeding £1,250,000, the United States and Germany each supplied a little more than 34 per cent., the United Kingdom 9, and France 6.

RESEARCH ON THE WASTE LYE of the Swedish pulp mills has led to the development of two interesting commercial products. Part of the lye is now being turned into liquid resin or pine oil, and sold in this state, largely for export, but also to some extent to the Swedish soap works. A new process has also been developed, by means of which a light-coloured intermediate product, obtained by evaporation, is turned into a glue. Under the name of Sulfo Glue, this is marketed at a very low price, in view of the cheapness of the raw materials. It would seem to offer a serviceable substitute in many cases for vegetable glues or dextrine. Another advantage claimed for the new product is that it will neither sour nor turn mouldy in prepared state. Mixed with chalk or similar material, this glue produces the so-called "Sulfo Plastic," which lends itself to stucco patterns of the most durable description, and can be applied without any preliminary preparation of the surface.

THE BRAZILIAN GOVERNMENT has prohibited the exportation of animal bones intended for fertiliser, glue manufacture or other industrial purposes.

THE FINANCE MINISTER OF YUGOSLAVIA has authorised the erection of a new alcohol factory at Pleternica with an annual capacity of 900 hectolitres of denatured alcohol.

A LOAN OF 100,000 CROWNS has been granted by the Norwegian Government for the erection of a tannic-acid factory near Lillesand. Private subscription is raising the balance of the capital, about 30,000 crowns.

LEADING MAKERS OF ACTIVE CARBONS in Germany have formed a new company to engage in joint research work and to direct the exploitation of certain patents. The style of the new concern is "Aktivkohle-Union-Verwaltungs G.m.b.H., Frankfurt-am-Main" and the participants are the Deutsche Gold- und Silberscheideanstalt, the I.G., the Metall-Gesellschaft and the Verein für Chemische und Metallurgische Produkte.

THE EGYPTIAN MINISTRY OF PUBLIC HEALTH, anticipating difficulties in obtaining necessary supplies of aluminium sulphate for treatment of public water supplies, has experimented with ferrous sulphate as a coagulant. Existing sulphuric acid manufacturers have offered to make the iron salt at £E6 a long ton, but have requested protection against imports of aluminium sulphate for a period of years before sinking money in plant construction. The proposal is being studied by a special committee appointed by the Ministry of Commerce and Industry.

RECENT PRESS REPORTS from Switzerland indicate that the explorations for the development of production of potash in the Cantons of Baselland and Aargau, have shown satisfactory results. Assurances are given that deposits have been found which upon development will be sufficient to permit the gradual supply of Switzerland's needs from domestic sources. Present imports of potash and potassium compounds into Switzerland are valued at about two million Swiss francs. The principal sources of supply are Germany and France.

LACK OF PLANT for factory equipment owing to the cutting off of imports from Germany, and increased costs of building materials, have led to the modification of plans, developed under Tata auspices, for the large-scale manufacture of heavy chemicals in Bombay. Other notable enterprises in India suffering from the lack of industrial equipment are the paper industry, which needs wood pulp and chemicals, and the electric wire and cable factories, seeking new sources of supply for copper, insulating materials, and the like, while other manufacturers are in need of brass castings, paint and tanning materials, and a great variety of semi-manufactures.

AUTHORITIES IN CEYLON have shown some concern over the prices of formic acid and acetic acid. These acids are necessary to the processing of rubber and were formerly almost exclusively from Germany. With the outbreak of war, the prices of these two acids rose about 400 per cent. and caused some worry to the rubber industry. The amount of such acids imported into Ceylon is not great, but naturally is of considerable importance to the rubber industry. In 1938, 1,832 cwt. of formic acid, valued at Rs. 69,023, were imported. Acetic acid is not so much used as formic acid and is considered more as a substitute for it. Imports of acetic acid in 1938 amounted to 468 cwt., valued at Rs. 11,018. It has been stated that acetic acid can be manufactured locally from coconut shells, and efforts will be made to produce it locally unless supplies are forthcoming from abroad at reasonable rates.

KALI CHEMIE A.G., an outstanding producer of chemicals in Germany, including alkalis, industrial potash salts, per-salts and other inorganics, also superphosphate and mineral earth pigments, floated in December, 1939, a bond-issue of RM.10,000,000. Half the issue has been already subscribed and the remainder will be released shortly. The issue matures in 20 years and will bear interest at the rate of 5 per cent. This is the first time that Kali Chemie has had to resort to bond issues for its financial requirements. Proceeds will be used largely to meet expenditure involved in plant expansion during 1937-1938 involving some 15,000,000 marks. An important part of the investment was accounted for by the enlargement of the Electrolytic Alkali Plant at Bitterfeld, operated by the company's Neu-Stassfurt subsidiary. Kali Chemie had an estimated turnover in 1938 of 70,000,000 marks, an increase of 10 per cent. over 1937. Export trade probably accounted for 15 per cent. of its total in 1938 sales.

TREMOLITE TALC ORES have been tested by the U.S. Bureau of Mines, with a view to ascertaining their amenability to froth flotation. An important outcome of the investigation was the discovery that nothing need be wasted through beneficiation. The magnesitic tailing, enriched in tremolite, is suitable alone or blended with the feed, for use in wall tiling. Even limey talc could be freed sufficiently from dolomite or limestone by flotation to allow its use for this purpose. Different flotation reagents were required for different ores. Pine oil was used for foliated talc and amine-type reagents for fibrous talc. Quartz was easily depressed, but tremolite and dolomite required additional acid or alkaline depressants. Considering both purity of concentrate and recovery, the best collectors were di-N-butylamine, tri-N-butylamine diamylamine, and alpha-picoline. To clean the surface of gangue minerals, several dispersants were tried, of which sodium carbonate gave best results.

Forthcoming Events

THE SIXTH MEETING of the Society of Chemical Industry, London Section, will be held on March 4, at 5.30 p.m. in the Rooms of the Chemical Society, Burlington House, London, W.1. A paper on "Microanalytical Methods as Applied to Inorganic Substances" will be presented by Miss I. H. Hadfield, M.Sc.

A PAPER on "Wood Preservation in Building Construction" will be delivered by Mr. E. H. Boulton at a joint meeting of the Chemical Engineering Group and the Road and Building Materials Group of the Society of Chemical Industry on March 5. The meeting will start at 7.30 p.m. and will be held at Burlington House, London, W.1.

THE POSTPONED ANNUAL JOINT MEETING of the Liverpool Section, Society of Chemical Industry, with the Manchester Section will be held in Reece's Parker Street Restaurant, Liverpool, on March 5, at 6.30 p.m., when a Jubilee Memorial Lecture will be delivered by Sir John Boyd Orr, entitled "The Chemical Aspects of Nutrition as Applied to Animals and Human Beings."

AN ORDINARY MEETING of the Institution of Chemical Engineers will be held on March 8, in the Rooms of the Geological Society, Burlington House, Piccadilly, London, W.1, at 5.15 p.m., when the following papers will be presented: "Further Experiments on the Evaporation of Water from Saturated Surfaces," by Dr. R. W. Powell, and "Heat Transmission in Evaporative Condensers," by Dr. A. K. G. Thomson.

A CONFERENCE ON "The Problems of the Industrial Scientist" convened by the Association of Scientific Workers and the British Association of Chemists, will be held on March 9, at 2 p.m., in the lecture hall of the Pharmaceutical Society, 17 Bloomsbury Square, London, W.C.1. All scientific workers and others interested are cordially invited to attend and participate. Professor F. G. Donnan will be in the chair, and Mr. Hugh Linstead of the Pharmaceutical Society will open the proceedings with a general survey of the problems of scientists employed in industry. This will be followed by a series of short papers and discussions on cognate subjects. Similar conferences are being held at Liverpool, at 6.30 p.m., on March 4, at 5-6 Bluecoat Chambers, Liverpool, 1; at Manchester, at 3.0 p.m., on March 16, in the Chemistry Lecture Theatre, The University; and at Birmingham (date to be announced later).

THE NEXT INFORMAL LUNCHEON of the Chemical Club will be held at 1 p.m. on March 11, in the Club's premises at 2 Whitehall Court, S.W.1, when Mr. A. Vyvyan Board, D.S.O., Controller of Molasses and Industrial Alcohol, and a Director of the Distillers Company Limited, will discuss problems of Government control.

THE THIRD EVENING MEETING of the Pharmaceutical Society of Great Britain will be held in the Society's House, 17 Bloomsbury Square, London, W.C.1, on March 12, at 7.30 p.m. A lecture entitled "Some Aspects of Drug Addiction" will be given by Dr. W. P. Kennedy, a member of the Poisons Board and formerly Professor of Psysiology in the University of Baghdad.

A MEETING OF THE INSTITUTE OF FUEL will be held in the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2, at 6 p.m., on March 14, when a paper will be presented by Mr. A. F. Webber, A.M.I.Mech.E., M.I.Loco.E., F.Inst.F., entitled "Regenerative Feed Heating in Industrial Power Plants." Members of any technical societies interested in this subject will be cordially welcomed.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

EXTRACTION OF GELATINE FROM CASEIN.—Aktieselskabet Dansk Goering-Industri. (Denmark, Feb. 11, '39.) 2172.

DEHYDROGENATION OF PARAFFINS and paraffin-olefin mixtures.—C. Arnold (Standard-I. G. Co.). 2262

CATALYTIC CRACKING OF HYDROCARBON OILS.—C. Arnold (Standard-I. G. Co.). 2265.

MANUFACTURE OF ABRASIVE MATERIALS.—Babcock and Wilcox Co. (United States, Feb. 11, '39.) 2382.

MANUFACTURE OF FLUORESCENT PAINTS, coatings, plastic masses, etc.—B.B. Technical Industries (Manufacturing), Ltd., J. P. Brennan and G. F. Brennan. 1990.

LUMINOUS TRANSLUCENT DEVICES.—B.B. Technical Industries (Manufacturing), Ltd., J. P. Brennan and G. F. Brennan. 2380.

PROCESS FOR THE PREPARATION of di-aryl-alkyl-ethylene derivatives.—Chinoin Gyógyszer és Vegyészeti Termékek Gyára Reszvenytarsasag (Dr. Kereszty and Dr. Wolf). (Hungary, Feb. 7, '39.) 2061. (Hungary, Dec. 2, '39.) 2062.

ELECTROPLATING METALS.—Dow Chemical Co. (United States, March 1, '39.) 2362.

ELECTROPLATING MAGNESIUM and alloys thereof.—Dow Chemical Co. (United States, March 13, '39.) 2363.

MANUFACTURE OF ORGANIC COMPOUNDS.—H. Dreyfus. 2140.

PRODUCTION OF ESTERS, ether-esters, and ether-acids.—E. I. du Pont de Nemours and Co. (United States, Feb. 2, '39.) 2094.

MANUFACTURE OF POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Feb. 7, '39.) 2370.

MANUFACTURE OF TEXTILE-TREATING AGENTS.—E. I. du Pont de Nemours and Co., and R. W. Maxwell. 2268.

MANUFACTURE OF AMIDINE DERIVATIVES.—J. R. Geigy A.-G. (Switzerland, Dec. 19, '39.) 2065.

MANUFACTURE OF PARA-FURFURYLIDENE-AMINOBENZENE-SULPHONAMIDE.—J. R. Geigy A.-G. (Switzerland, Nov.1, '39.) 2066.

PORTABLE GAS PRODUCER.—Grant and West, Ltd., and J. W. B. Stokes. 2121.

APPARATUS FOR THE DETECTION and measurement of impurities in liquids or for the measurement of the concentration of solutions forming electrolytes.—W. Gregson, J. H. S. Watt and G. F. Ward. 2123.

COATING OF LACQUER.—E. Hermann. 2246.

PROCESS FOR THE MANUFACTURE OF ETHERS and esters of di-tocophenols.—F. Hoffman-La Roche and Co. A.-G. (Switzerland, Feb. 14, '39.) 1984.

MANUFACTURE OF ALKALI METAL SULPHIDES.—A. P. Lowes and Imperial Chemical Industries, Ltd. 1983.

ELECTRODEPOSITION OF NICKEL.—Mond Nickel Co., Ltd. International Nickel Co., Inc.). 2390.

METHOD FOR RECOVERING hydroxy-3-actiocholenic acid and its esters.—N. V. Organon. (Holland, March 16, '39.) 2096.

PROCESS FOR THE PRODUCTION of hydrocarbons by conversion of carbon monoxide with hydrogen.—H. E. Potts (N. V. International Koolwaterstoffen Synthese Maatschappij) (International Hydrocarbon Synthesis Co.). 2177.

MANUFACTURE OF HYDROGEN.—Power-Gas Corporation, Ltd., R. W. Rutherford and A. T. Grisenthwaite. 2178.

PLASTIC COMPOSITIONS.—Rubber Cement Products, Ltd., and R. H. P. Watts. 2222.

PROCESS AND EQUIPMENT for conversion of vegetable oils into liquid saturated hydrocarbons.—Sageb (S.A. de Gestion et d'Exploitation de Brevets). (Luxembourg, Feb. 18, '39.) 2223.

PROCESS FOR THE SIMULTANEOUS MANUFACTURE OF IRON and alumina and of hydraulic cement, etc.—J. C. Seailles. (Luxembourg, Feb. 6, '39.) 2316.

Complete Specifications Open to Public Inspection

MANUFACTURE OF STARCH.—Corn Products Refining Co. July 11, 1938. 13028/39.

PROCESS FOR THE PRODUCTION OF DISINFECTANTS.—G. G. W. Madaus, F. J. N. Madaus, and J. M. T. Madaus. July 8, 1938. 15600/39.

MANUFACTURE OF AMIDINE DERIVATIVES.—Soc. of Chemical Industry in Basle. (Cognate Application, 16688/39.) June 9, 1938. 16687/39.

MANUFACTURE OF ORTHO-HYDROXY-AZO DYESTUFFS.—I. G. Farbenindustrie. July 7, 1938. 18208/39.

FORMATION OF PLASTIC SHEETS.—Carbide and Carbon Chemicals Corporation. July 9, 1938. 18434/39.

DISTILLATION OF COAL, lignite, schist, or the like.—H. du Saugey. June 30, 1938. 19081/39.

PROCESS OF REPLENISHING AND CORRECTING THE ELECTROLYTE in the refining of aluminium by igneous electrolysis.—Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges, et Camargue. July 12, 1938. 19090/39.

MANUFACTURE AND PRODUCTION OF CONDENSATION PRODUCTS.—I. G. Farbenindustrie. July 7, 1938. 19343/39.

LAMINATED CELLULOSIC SHEET and strip material, and the manufacture thereof.—British Cellophane, Ltd. July 9, 1938. 19493/39.

PROCESS FOR THE MANUFACTURE OF TROPIC ACID AMIDE and its neutral N-substituted derivatives.—F. Hoffmann-La Roche and Co. A.-G. July 7, 1938. 19578/39.

SULPHONATION.—Colgate-Palmolive-Peet Co. July 7, 1938. 19668/39.

MINERAL OILS.—British Thomson-Houston Co., Ltd. July 7, 1938. 19721/39.

MANUFACTURE OF ANTIMONY TRIOXIDE PIGMENTS.—I. G. Farbenindustrie. July 7, 1938. (Cognate Application, 19736/39.) 19735/39.

PROCESS OF PRODUCING LARGE CRYSTALS OF ERGOSTEROL, and the product resulting therefrom.—General Mills, Inc. July 9, 1938. 19957/39.

MANUFACTURE OF CARBAMIC ACID ESTERS of aliphatic glycol ethers. Dr. A. Wacker Ges. fur Elektrochemische Industrie Ges. July 12, 1938. 20039/39.

APPARATUS FOR WORKING PLASTIC MASSES, emulsions, and the like.—I. G. Farbenindustrie. July 9, 1938. 20043/39.

PROCESS FOR THE EXTRACTION OF THE VALUABLE CONTENTS FROM ANTIMONIAL, arsenical, and other complex ores.—P. Loring. July 12, 1938 (Cognate Application, 20290/39.) 20289/39.

MANUFACTURE OF POLYETHINES and derivatives thereof.—Dr. A. Wacker Ges. fur Elektrochemische Industrie Ges. July 13, 1938. 20305/39.

OXIDATION OF CYCLIC HYDROCARBONS.—E. I. du Pont de Nemours and Co. July 12, 1938. (Cognate Application, 20336/39.) 20335/39.

MANUFACTURE OF POLY-SUBSTITUTED ETHYLENE COMPOUNDS.—Soc. of Chemical Industry in Basle. July 13, 1938. 20414/39.

Specifications Accepted with Date of Application

PROCESS FOR THE MANUFACTURE OF WOOL DYESTUFFS of the anthraquinone series.—I. G. Farbenindustrie. July 26, 1937. (Cognate Application, 22234/38.) 517,396.

PRODUCTION OF ESTER DERIVATIVES OF DEXTRAN.—G. L. Stahly, and W. W. Carlson. July 29, 1937. 517,398.

PLASTICISERS and plasticised coating-compositions.—Sylvania Industrial Corporation. Aug. 7, 1937. 517,236.

PRODUCTION OF TECHNICALLY VALUABLE CHLORINATED HYDROCARBONS.—Rohm and Haas Ges. Aug. 30, 1937. 517,213.

DIESTERS OF UNSATURATED GLYCOLS, and processes of preparing same.—Armour and Co. Nov. 22, 1937. 517,247.

MANUFACTURE OF KETONES of the cyclopentanopolyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. July 14, 1937. (Cognate Applications, 11700/39 and 11701/39). (Divided out of 517,277.) 517,307.

PREPARATION OF EMULSIONS.—E. M. Schwarz, F. O. Zschimmer, G. E. Zschimmer, G. M. W. Schwarz and F. W. R. Schwarz (trading as Zschimmer and Schwarz Chemische Fabrik Dolau). April 23, 1937. 517,612.

MANUFACTURE OF PENTA-METHYLENEOXIDE COMPOUNDS and pentamethylenesulphide compounds.—W. W. Groves (I. G. Farbenindustrie.) March 31, 1938. 517,414.

ELECTROCHEMICAL TREATMENT OF METAL.—S. J. Blaut, and H. M. Lang. April 22, 1938. 517,415.

PRODUCTION OF WOOL-LIKE FIBRES of cellulosic origin.—R. Wallach. May 26, 1938. (Cognate Application, 17070/38.) 517,464.

MANUFACTURE OF SULPHUR-CONTAINING ORGANIC COMPOUNDS.—S. Ellingworth, F. L. Rose, and Imperial Chemical Industries, Ltd. June 27, 1938. (Cognate Application, 14768/39.) 517,421.

PREPARATION OF AMINO ALCOHOLS.—Chemical Works, formerly Sandoz. July 21, 1937. (Samples furnished.) 517,525.

PROCESS FOR THE MANUFACTURE OF WATER-GAS enriched with hydrogen.—Gas Light and Coke Co., A. E. Haffner, and S. Pexton. July 23, 1938. (Cognate Application, 34524/38.) 517,530.

STEROID KETONE COMPOUNDS and their preparation.—Parke, Davis, and Co. Aug. 10, 1937. 517,537.

MANUFACTURE OF NITROGENOUS ANTHRAQUINONE DERIVATIVES.—Soc. of Chemical Industry in Basle. July 29, 1937. (Cognate Application, 22347/38.) 517,434.

SEPARATION AND PURIFICATION OF CARBONYL COMPOUNDS obtainable by side chain degradation of steroids.—Soc. of Chemical Industry in Basle. Aug. 4, 1937. (Cognate Application, 22349/38.) 517,435.

MANUFACTURE OF HYDROXYLAMINE HYDROCHLORIDE.—I. G. Farbenindustrie. Aug. 17, 1937. 517,436.

RECOVERY OF PHENOLS from oils and waste aqueous liquors.—G. W. Johnson (I. G. Farbenindustrie.) July 27, 1938. 517,618.

SEPARATION BY DISTILLATION OF COMPONENTS of a mixture of hydrocarbons.—R. F. Ruthruff (M. W. Kellogg Co.). July 27, 1938. 517,440.

REGENERATING COPPER contained in the waste liquors of cuprammonium artificial silk production.—I. G. Farbenindustrie, and Duisburger Kupferhutte. July 30, 1937. 517,452.

Weekly Prices of British Chemical Products

FAIRLY satisfactory trading conditions are reported in the industrial chemical market and the tone generally remains decidedly firm. Inquiries both for home and export have been on a good scale, although spot offers are difficult to procure for items such as barium chloride, oxalic acid, yellow prussiate of potash and sodium and potassium bichromates. Formaldehyde, borax and boric acid continue in good request. Prices throughout remain steady with a firm undertone. Business in coal tar products is rather less brisk with quotations unchanged at recent levels; the undertone, however, remains firm with carbolic acid both crude and crystals the chief centre of interest.

MANCHESTER.—Generally firm price conditions continue to characterise the Manchester chemical market, with the potash products one of the strongest sections. A further advance in permanganate prices has been announced during the past few days. A moderate amount of new business in the aggregate has been reported this week, with a continued steady call for contract deliveries experienced from the leading industrial users. Among the by-products carbolic acid, both crude and crystals, has again met with an active demand and recent advances have been fully maintained. The xylols, naphthas and other light distillates are also being taken up in good quantities at firm rates.

GLASGOW.—A normal amount of business has been transacted in the Scottish heavy chemical market during the past week with prices very firm in all sections. Considerable activity has been evident with glucose, rosins and fertilisers. A substantial demand for waxes has also been noticed, although in this commodity ruling prices are very high. In the case of certain waxes of German origin, substitutes are eagerly sought.

Price Changes

Rises: Hexamine, Lead Nitrate, Oxalic Acid, Potash (caustic), Salammoniac, Sodium Chlorate, Sodium Prussiate.

* In the case of certain products, here marked with an asterisk, the market is nominal, and the last ascertainable prices have been scheduled. At present all intermediates are included under this head.

General Chemicals

ACETIC ACID.—Maximum prices per ton: 80% technical, 1 ton £34 15s.; 10 cwt./1 ton, £35 15s.; 4/10 cwt., £36 15s.; 80% pure, 1 ton, £36 15s.; 10 cwt./1 ton, £37 15s.; 4/10 cwt., £38 15s.; commercial glacial, 1 ton, £44; 10 cwt./1 ton, £45; 4/10 cwt., £46; delivered buyers' premises in returnable barrels. £4 per ton extra if packed and delivered in glass.

ACETONE.—Maximum prices per ton, 50 tons and over, £49 10s.; 10/50 tons, £50; 5/10 tons, £50 10s.; 1/5 tons, £51; single drums, £52, delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

*ALUM.—Loose lump, £8 7s. 6d. per ton d/d.

*ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—99.95%, 1s. to 2s. per lb. according to quantity in loaned cylinders, carriage paid; less for important contracts.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £18 per ton, in casks, ex wharf. See also Salammoniac.

*ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—99/100%, about £25 per ton, ex store

BARIUM CHLORIDE.—98/100%, prime white crystals, £11 10s. 0d. to £13 0s. 0d. per ton when available, bag packing, ex works; imported material would be dearer.

BLEACHING POWDER.—Spot, 35/37% £9 5s. per ton in casks, special terms for contract.

BORAX, COMMERCIAL.—Granulated, £20 10s. per ton; crystal, £21 10s.; powdered, £22; extra finely powdered, £23; B.P. crystals, £29 10s.; powdered, £30; extra fine, £31 per ton for ton lots in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £64; powder, £65; in tin-lined cases for home trade only, packages free, carriage paid in Great Britain.

BORIC ACID.—Commercial granulated, £34 10s. per ton; crystal, £35 10s.; powdered, £36 10s.; extra finely powdered, £38 10s.; large flakes, £47; B.P. crystals, £43 10s.; powdered, £44 10s.; extra fine powdered, £46 10s. per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain.

CALCIUM BISULPHITE.—£7 10s. per ton f.o.r. London.

*CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

CHARCOAL LUMP.—£10 to £12 per ton, ex wharf. Granulated £11 to £14 per ton according to grade and locality.

*CHLORINE, LIQUID.—£19 15s. per ton, d/d in 16/17 cwt. drums (3-drum lots); 4¾d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 4d. per lb.; liquor, £19 10s. per ton d/d station in drums. GLASGOW: Crystals 4d. per lb. in original barrels.

CHROMIC ACID.—1s. per lb., less 2½d.%; d/d U.K. GLASGOW: 1s. 0¼d. per lb. for 1 cwt. lots.

CHROMIC OXIDE.—1s. 2d. per lb., d/d U.K.

CITRIC ACID.—1s. 2d. per lb. MANCHESTER: 1s. 3d.

*COPPER SULPHATE.—Nominal.

CREAM OF TARTAR.—100%, £6 2s. to £6 7s. per cwt., less 2½%. Makers' prices nominal, imported material about £170 per ton, to quantity, d/d in sellers' returnable casks; imported material would be dearer.

FORMIC ACID.—85%, £44 10s. per ton for ton lots, carr. paid, carboys returnable; smaller parcels quoted at 46s. 6d. to 49s. 6d. per cwt., ex store.

GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

HEXAMINE.—Technical grade for commercial purposes, 1s. 4d. per lb.; free-running crystals are quoted at 1s. 7½d. to 1s. 10½d. per lb.; carriage paid for bulk lots.

HYDROCHLORIC ACID.—Spot, 6s. 1½d. to 8s. 7½d. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 9s. 2d. to 13s. per lb., according to quantity.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £30 10s. per ton; 50% by weight, £35; 80% by weight, £60; pale tech., 50% by vol., £36; 50% by weight, £42; 80% by weight, £67. One ton lots ex works; barrels returnable.

LEAD ACETATE.—White, £48 to £50, ton lots.

LEAD NITRATE.—About £44 per ton d/d in casks.

LEAD, RED.—English, 5/10 cwt., £41 10s.; 10 cwt. to 1 ton, £41 5s.; 1/2 tons, £41; 2/5 tons, £40 10s.; 5/20 tons, £40; 20/100 tons, £39 10s.; over 100 tons, £39 per ton, less 2½ per cent., carriage paid; non-setting red lead, 10s. per ton dearer in each case; Continental material, £1 per ton cheaper.

LEAD, WHITE.—Dry English, less than 5 tons, £51; 5/15 tons, £47; 15/25 tons, £46 10s.; 25/50 tons, £46; 50/200 tons, £45 10s. per ton, less 5% carriage paid; Continental material, £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £59 10s. 5/10 cwt., £58 10s.; 10 cwt. to 1 ton, £58; 1/2 tons, £56 10s.; 2/5 tons, £55 10s.; 5/10 tons, £53 10s.; 10/15 tons, £52 10s.; 15/25 tons, £52; 25/50 tons, £51 10s.; 50/100 tons, £51 per ton, less 5% carriage paid. Continental material £2 per ton cheaper.

LITHARGE.—10 cwt.-1 ton, £34 15s. per ton.

MAGNESITE.—Calcined, in bags, ex works, about £9 to £10 per ton.

MAGNESIUM CHLORIDE.—Solid (ex wharf), £10 per ton

*MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf

MERCURY PRODUCTS.—Controlled prices for 1 cwt. quantities: Bichloride powder, 9s. 1d.; bichloride lump, 9s. 8d.; bichloride ammon. powder, 10s. 7d.; bichloride ammon. lump, 10s. 5d.; mercurous chloride, 10s. 11d.; mercury oxide, red cryst., B.P., 12s. 3d.; red levig. B.P., 11s. 9d.; yellow levig. B.P., 11s. 7d.

*METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d more in all cases and the range of prices is according to quantities.

*NITRIC ACID.—Spot, £19 to £26 per ton, according to strength, quantity and destination.

OXALIC ACID.—From £60 per ton for ton lots, carriage paid, in 5-cwt. casks; smaller parcels would be dearer; deliveries slow.

*PARAFFIN WAX.—GLASGOW: 3¾d per lb

POTASH, CAUSTIC.—Liquid, £30 to £35 per ton, according to quantity.

POTASSIUM BICHROMATE.—5¾d. per lb. carriage paid. GLASGOW: 5¾d. per lb., carriage paid.

POTASSIUM CHLORATE.—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

POTASSIUM IODIDE.—B.P., 8s. to 11s. 2d. per lb., according to quantity.

POTASSIUM NITRATE.—Small granular crystals, £26 to £29 per ton ex store, according to quantity.

POTASSIUM PERMANGANATE.—B.P. 1s. 5¾d. per lb.; commercial, £8 1s. 6d per cwt., d/d.

POTASSIUM PRUSSIATE.—Yellow, about 1s. 8d. per lb., supplies scarce.

SALAMMONIAC.—Dog-tooth crystals, £44 per ton; medium, £38; fine white crystals, £16 10s.; in casks, ex store.
SALT CAKE.—Unground, spot, £4 1s. per ton.
SODA ASH.—Light 98/100%, £6 2s. 6d. per ton f.o.r. in bags.
SODA, CAUSTIC.—Solid, 76/77° spot, £14 per ton d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE.—£25 to £26 per ton, ex wharf.
SODIUM BICARBONATE.—About £10 10s. to £11 10s. per ton, in bags.
SODIUM BICHROMATE.—Crystals, 4¾d. per lb., net d/d U.K. with rebates for contracts. GLASGOW: 5¾d. per lb., carriage paid.
SODIUM BISULPHITE POWDER.—60/62%, £16 per ton d/d in 2-ton lots for home trade.
SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.
SODIUM CHLORATE.—£32 to £39 per ton, d/d according to quantity.
SODIUM HYPOSULPHITE.—Pea crystals, £16 17s. 6d. per ton for 2-ton lots; commercial, £13 10s. per ton. MANCHESTER: Commercial, £13; photographic, £16 10s.
SODIUM IODIDE.—B.P., for not less than 28 lb., 8s. 10d. per lb.; for not less than 7 lb., 10s. 9d. per lb.
*SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 5s. per ton for 6-ton lots d/d.
SODIUM NITRITE.—£18 15s. per ton for ton lots.
SODIUM PERBORATE.—10%, £4 10s. per cwt. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £16 to £17 per ton delivered for ton lots. Tri-sodium, £18 per ton delivered per ton lots.
SODIUM PRUSSIATE.—From 6d. per lb. ex store.
SODIUM SILICATE.—£8 2s. 6d. per ton.
*SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £4.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £13 15s. per ton d/d in drums; crystals, 30/32%, £9 10s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £13; crystals, £9 15s.
*SODIUM SULPHITE.—Pea crystals, spot, £16 per ton d/d station in kegs.
*SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.—1s. 5½d. per lb., less 5%, carriage paid for lots of 5 cwt. and upwards. Makers' prices nominal; imported material 2s. 3d. to 2s. 6d. per lb., ex wharf. MANCHESTER: 1s. 5¾d. per lb.
ZINC OXIDE.—Maximum prices: White seal, £30 17s. 6d. per ton; red seal, £28 7s. 6d. d/d; green seal, £29 17s. 6d. d/d buyers' premises.
ZINC SULPHATE.—Tech., about £19 10s., carriage paid, casks free.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 9½d. to 1s. 6d. per lb., according to quality. Crimson, 1s. 7½d. to 1s. 10½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 6d. to 1s. 8d. per lb.
BARYTES.—Imported material £6 to £9 per ton according to quality.
CARBON BLACK.—About 7d. to 7½d. per lb., according to quantity.
CARBON DISULPHIDE.—£29 to £34 per ton, according to quantity, in free returnable drums.
CARBON TETRACHLORIDE.—£48 to £53 per ton, according to quantity, drums extra.
INDIA-RUBBER SUBSTITUTES.—White, 5¾d. to 6¾d. per lb.; dark 5½d. to 6d. per lb.
LAMP BLACK.—Imported material is quoted at about £35 to £40 per ton.
LITHOPONE.—30%, £18 17s. 6d. per ton; 60%, £31 to £32 per ton. Imported material would be dearer.
SULPHUR.—Finely powdered, about £15 per ton, delivered.
SULPHUR CHLORIDE.—6d. to 8d. per lb., according to quantity.
VEGETABLE BLACK.—£35 per ton upwards; 28/30%, £15 10s. 0d.; 60%, £29, delivered buyers' premises.
VERMILION.—Pale or deep, 8s. 5d. per lb., for 7 lb. lots.
ZINC SULPHIDE.—About £63 per ton ex works.

Plus 5% War Charge.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—Per ton in 6-ton lots d/d farmer's nearest station up to January 31, 1940, £9; February, £9 3s.; March/June, £9 6s.
CALCIUM CYANAMIDE.—£12 10s. for 5-ton lots per ton net f.o.r. or ex store, London. Supplies small.
"NITRO-CHALK."—£8 18s. per ton, in 6-ton lots, d/d farmer's nearest station, January/June delivery.
CONCENTRATED COMPLETE FERTILISERS.—£11 18s. to £12 4s. per ton in 6-ton lots, d/d farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£11 14s. to £16 6s. per ton in 6-ton lots, d/d farmer's nearest station.

Coal Tar Products

BENZOL.—Industrial (containing less than 2% of toluol), 2s. to 2s. 1d. per gal., ex works, nominal.
CARBOLIC ACID.—Crystals, 10d. per lb.; Crude, 60's, 3s. 3d. to 3s. 6d., according to specification. MANCHESTER: Crystals, 1s. to 1s. 1d. per lb., d/d; crude, 3s. 9d. to 4s.; naked, at works.
CREOSOTE.—Home trade, 5d. per gal., f.o.r., makers' works; exports 6d. to 6½d. per gal., according to grade. MANCHESTER: 4¼d. to 7d.
CRESYLIC ACID.—99/100%, 2s. 11d. to 3s. 3d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 3s.
NAPHTHA.—Solvent, 90/160°, 1s. 8d. to 1s. 9d. per gal.; solvent, 95/60°, 1s. 11d. to 2s., naked at works; heavy, 90/190°, 1s. 3d. to 1s. 5d. per gal., naked at works, according to quantity. MANCHESTER: 90/160°, 1s. 7½d. to 1s. 10½d. per gal.
NAPHTHALENE.—Crude, whizzed or hot pressed, £10 to £11 per ton; purified crystals, £16 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £17.
PITCH.—Medium, soft, 35s. per ton, f.o.b MANCHESTER: 37s. 6d., f.o.b. East Coast.
PYRIDINE.—90/140°, 19s. to 20s. per gal.; 90/160°, 16s. to 18s. 6d.; 90/180°, 3s. 9d. to 4s. 6d. per gal., f.o.b. MANCHESTER: 17s. 6d. to 20s. per gal.
TOLUOL.—90%, 2s. 3d. per gal.; pure, 2s. 5d., nominal. MANCHESTER: Pure, 2s. 5d. per gal., naked.
XYLOL.—Commercial, 2s. 7d. per gal.; pure, 2s. 9d. MANCHESTER: 2s. 11d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £8 to £8 10s. per ton; grey, £12 to £13 MANCHESTER: Grey, £14.
METHYL ACETONE.—40.50%, £42 per ton.
WOOD CREOSOTE.—Unrefined, 1s. to 1s. 3d. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.—3s. 7d. to 4s. per gal.; solvent, 4s. to 4s. 6d. per gal.
WOOD TAR.—£5 to £6 per ton, according to quality.

*Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—1s. 10d. per lb., for cwt. lots, net packages.
BENZIDINE, HCl.—2s. 7d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P (ex toluol).—1s. 11d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—8d. to 9d. per lb. in 1-ton lots.
p-CRESOL 34/35° C.—1s. 8d. to 1s. 9d. per lb. in ton lots.
DICHLORANILINE.—2s. 1½d. to 2s. 7d. per lb.
DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.
DINITROBENZENE.—8d. per lb.
DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.
DINITROTOLUENE.—48/50° C., 9d. per lb.; 66/68° C., 11½d.
DIPHENYLAMINE.—Spot, 2s. 3d. per lb.; d/d buyer's works.
GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.
H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.
NAPHTHIONIC ACID.—1s. 10d. per lb.
β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.
α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.
β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.
o-NITRANILINE.—4s. 3½d. per lb.
m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 10d. to 2s. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5½d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—10d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8¾d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—11d. per lb., in 8/10 cwt. drums, drums extra.
p-TOLUIDINE.—2s. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON.—February 27.—For the period ending March 2, per ton, net, naked, ex mill, works or refinery, and subject to additional charges according to package and location of supplies:—LINSEED OIL, raw, £46 5s. RAPESEED OIL, crude, £44 5s. COTTONSEED OIL, crude, £31 2s. 6d.; washed, £34 5s.; refined edible, £35 12s. 6d.; refined deodorised, £36 10s. SOYA BEAN OIL, crude, £33; refined deodorised, £37. COCONUT OIL, crude, £28 2s. 6d.; refined deodorised, £31 7s. 6d. PALM KERNEL OIL, crude, £27 10s.; refined deodorised, £30 15s. PALM OIL, refined deodorised, £33. GROUNDNUT OIL, crude, £35 10s.; refined deodorised, £40. WHALE OIL, crude hardened, 42 deg., £30 10s.; refined hardened, 42 deg., £33. ACID OILS.—Groundnut, £24; soya, £22; coconut and palm kernel, £22 10s. ROSIN, 25s. to 35s. per cwt., ex wharf, according to grade. TURPENTINE, 54s. 9d. per cwt., spot, American, including tax, ex wharf, barrels, and ex discount.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BRISTOL CHANNEL OIL WHARVES, LTD., London, E.C. (M., 2/3/40.) Feb. 16, additional security supplemental to a debenture dated April 9, 1936, to Equity and Law Life Assurance Society; charged on land at Royal Edward Dock, Avonmouth. *£10,000. Dec. 14, 1939.

F. AND C. NON-FERROUS FOUNDRIES, LTD., Slough. (M., 2/3/40.) Feb. 14, £1,000 debenture to Gascoignes (Reading), Ltd.; general charge. *Nil. Oct. 5, 1938.

HAREFIELD LIME CO., LTD., London, E.C. (M., 2/3/40.) Feb. 15, £7,000 and £3,000 debentures, to Lombard Street Nominees, Ltd.; general charge. *£7,200. Jan. 31, 1939.

PALLAS OIL AND TRADING CO., LTD., London, E.C. (M., 2/3/40.) Feb. 16, mortgage, to British Maritime Trust, Ltd., securing £25,000 and all sums now or at any time owing by the company to the mortgagees; charged on s.s. *Stratford*. *Nil. July 21, 1939.

TIMOTHY WHITES AND TAYLORS, LTD., London, S.W., chemists and hardware merchants. (M., 2/3/40.) Feb. 16, £500,000 debenture stock secured by a Trust Deed dated Feb. 15, 1940; general charge (subject to etc.). *£1,000,000. June 2, 1939.

Satisfactions

YORKSHIRE INDIGO, SCARLET AND COLOUR DYERS, Ltd., Leeds. (M.S., 2/3/40.) Satisfaction Feb. 16, £600, part of amount outstanding July 1, 1908

Receiverships

MIDLAND PAINT AND VARNISH CO., LTD., Birmingham. (R., 2/3/40.) W. Le R. Hand, Fletchers Chambers, Fore Street, Birmingham. Feb. 9.

Company News

British Oxygen Co., Ltd., have declared a final ordinary dividend of 10 per cent., less tax (after Dominion tax relief at 6d.) at 7s. in the £. This brings the payment for 1939 to 17 per cent., the same as for 1938.

Yorkshire Indigo, Scarlet and Colour Dyers, Ltd., report for the year to December 31 last that net profits rose by £6,739, to £16,065. This enables the company to pay the dividend on the 5 per cent. preference shares for the three years to December 31, 1933. The transfer to reserve is doubled at £5,000 and the carry-forward is higher at £7,077, compared with £4,173.

Monsanto Chemicals, Ltd., report that trading profits during the year 1939 increased from £199,840 to £250,259. The depreciation provision is raised from £41,202 to £48,849, and tax takes £80,157 against £54,144. Net profits totalled £123,863, an increase of £14,955. The dividend is maintained at 33⅓ per cent. The transfer to reserve against trade investment is reduced from £16,000 to £4,600, which leaves the carry-forward higher at £201,340, compared with £196,789.

Courtaulds, Ltd., are paying a dividend of 7 per cent. for 1939, following the announcement of a final payment of 5 per cent. There was a sharp recovery in profits in 1939, the net figure rising £1,228,990, to £1,581,255. In 1938 profits fell over £2,000,000, to £352,265. The directors have transferred to reserve for contingencies the sum of £161,939, and propose to carry forward the surplus of £316,160. The sum of £284,844 carried forward in 1938 was after crediting £100,000 from reserve on stocks in trade, and £521,938 special reserve for insurance no longer required.

Chemical Trade Inquiries

Argentina.—An agent established at Buenos Aires wishes to establish contact with United Kingdom manufacturers of chemicals and drugs which he desires to import for his own account. (Ref. 86.)

Egypt.—The Commercial Secretary to H.M. Embassy in Egypt reports that the Prisons Administration of the Egyptian Ministry of the Interior is calling for tenders for the supply and delivery of coconut, sulphur, olive, linseed and palm oils; hydrogenated fat; potassium carbonate; caustic potash, solid; and borax—for soapmaking. Tenders, endorsed "Tender for the supply of oils, etc., for soapmaking," should be addressed to the Director-General of Prisons, Cairo, Egypt, by whom they will be received up to noon on March 19, 1940. (Ref. T. 16260/40.)

Turkey.—A firm of agents established at Istanbul wishes to obtain the representation of United Kingdom manufacturers of metals, chemical products, machinery, tools, etc., for Turkey. (Ref. 100.)

Chemical and Allied Stocks and Shares

MORE buoyant and active conditions have continued to rule in most sections of the Stock Exchange, and although best prices recorded during the past few days were not held, on balance share values have moved to higher levels. Sentiment is continuing to be assisted by the view that more active markets may persist because of the large sums that will become available for reinvestment owing to the proceeds of the requisitioning of American dollar securities. Moreover there is continued discussion in the market as to the early appearance of the expected big Defence Loan.

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Securities of chemical and associated companies again reflected the prevailing market trend, and there was a broadening of interest to shares which in recent weeks have not attracted much attention. B. Laporte, for instance, have been more active, and have moved up from 60s. 9d. to 65s. Imperial Chemical continued to be assisted by market anticipations that the dividend may again be brought up to 8 per cent. for the year, and as compared with a week ago have risen further from 31s. 9d. to 33s.; while the preference units were better at 32s. 6d. Lever and Unilever attracted buyers, awaiting the forthcoming dividend announcement, and the price has risen from 29s. 3d. to 32s. 6d. Some improvement was also recorded in Lever and Unilever N.V. British Match reflected the prevailing market tendency with a gain from 33s. 9d. to 34s. 9d.

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British Oxygen, Turner and Newall, Murex and other leading industrial securities with a large following were marked higher, as were British Aluminium. Sentiment in regard to the latter was influenced by market talk of a possible increase in the dividend. It is realised, however, that the Budget may bring increased taxation, and possibly a higher E.P.T. and that it is very difficult to form any definite opinion as to the dividend policy likely to be followed by individual companies. Associated Cement made some recovery from their recent sharp decline, the assumption being that, although the impending results are likely to show a sharp reduction in the dividend, this may be more than discounted in the current price of the shares. Securities of other companies connected with the building and allied trades also had a rather firmer appearance this week, including British Plaster Board and Wall Paper Manufacturers deferred units.

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Textile shares were mostly higher on balance, sentiment being assisted by the improved results which have recently been announced by important companies. Courtaulds have been active on the better figures for 1939 and hopes that statements at the meeting may indicate that there is a basis for expectations that further progress may be shown by the company in the current year. Lansil ordinary were higher on the possibility of an improved dividend being in prospect, while there was a good deal of activity in British Celanese ordinary and preference, although, as in most other directions, best prices touched this week were not maintained.

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Fison Packard moved up from 38s. 1½d. to around 39s. Borax Consolidated appreciated from 24s. 9d. to 27s. 9d. on further consideration of the past year's results. Low Temperature Carbonisation 2s. shares improved to 2s. 3d. International Paint were higher at 80s., and further gains were recorded in Pinchin Johnson, awaiting the impending dividend announcement.

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Boots Drug were better, and Beechams Pills also improved, the latter on market estimates that the total dividend may be around 25 per cent. Timothy Whites were 26s.

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On balance substantial improvement was recorded in "Shell," Burmah Oil, Trinidad Leaseholds and other oil shares, sentiment being governed by talk of a possible small increase in the petrol ration after Easter, although this report lacks confirmation.